260-120-252

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#10
3/23/92
L.H.

Serial No: 07/579,569
Filing Date: 09/10/90
Entitled: ELECTRONIC BALLAST CATHODE HEATING CIRCUIT
Applicant: Ole K. Nilssen

92-3748

Art Unit: 2502
Examiner: SON DINH

Applicant's phone number: 708-658-5615

APPEAL BRIEF

I, OLE K. NILSSEN, HEREWITH CERTIFY THAT THE DATE OF DEPOSIT WITH THE U.S. POSTAL SERVICE OF THIS PAPER OR FEE IS: 3-10-92

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Pursuant to NOTICE OF APPEAL, Applicant herewith provides an Appeal Brief.

A check (#4016) for $260.00 is enclosed.

Status of Claims

The pending claims are 1-12 and 19-27.

No claims are allowed.

Claims 1-12 and 19-27 are rejected under 35 USC 112, first paragraph, as lacking support in the specification.

Claims 1, 8-12, 19-21 and 24-25 are rejected under 35 USC 102b as being anticipated by Pitel '711 ("Pitel").

All Examiner's rejections are being appealed.

A copy of claims 1-12 and 19-27 is attached hereto by way of a document entitled Appendix CLAIMS on Appeal in Serial No. 07/579,569.

Status of Amendments

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There has been no amendment filed subsequent to Examiner's final rejection. However, a REQUEST FOR RECONSIDERATION was filed after Examiner's final rejection.

Summary of the Invention

With particular reference to Fig. 2 as modified in accordance with Fig. 8, the invention is concisely described by claim 25, as follows.

25. An arrangement comprising:

an L-C circuit having a tank inductor means and a tank capacitor means (elements 122 and 123 in Fig. 8 -- see 6th paragraph at page 10 of the specification); the L-C circuit including: (i) a set of L-C circuit input terminals (the terminal of tank inductor 123 not connected with tank capacitor 122 and the terminal of tank capacitor 122 not connected with tank inductor 123), (ii) a natural resonance frequency, and (iii) a set of L-C circuit output terminals (the terminals of tank capacitor 122); the tank inductor means having a main winding (123 -- 6th paragraph at page 10) and at least one auxiliary winding (e.g., 128 -- 6th paragraph at page 10) magnetically coupled with the main winding; the at least one auxiliary winding having a pair of auxiliary terminals (i.e., the terminals of winding 128);

inverter means (consisting of principal elements 42, 43, 47, 49 -- see the paragraph bridging pages 4 and 5) connected with a source of DC voltage (23 -- 3rd paragraph at page 4) and operative to supply an AC voltage (see Fig. 3A) at a set of inverter output terminals (the terminals connected with the L-C circuit input terminals, namely the terminal of tank inductor 123 not connected with tank capacitor 122 and the terminal of tank capacitor 122 not connected with tank inductor 123); the inverter output terminals being connected with the L-C circuit input terminals; the fundamental frequency of the AC voltage being, at least at times, higher than said natural resonance frequency; the AC voltage supplied to the L-C circuit input terminals being operative to cause a substantially sinusoidal output voltage to be provided at the L-C circuit output terminals (Fig. 3D); and

gas discharge lamp means (element 124 -- 6th paragraph at page 10) having a pair of lamp terminals (one terminal of each of cathodes 126 and 127) connected with the L-C circuit output terminals (i.e., via capacitor 131); the gas discharge lamp means having at least one thermionic cathode (e.g., 126 -- 6th paragraph at page 10) having a pair of cathode terminals connected with the axiliary terminals.

Issues

The issues presented for review are:

(1) Examiner's position to the effect that part of the subject matter of claims 1-12 and 19-27 lacks support in the specification as originally filed.

(2) Examiner's position to the effect that the subject matter of claims 1, 8-12, 19-21 and 24-25 is anticipated by Pitel '711.

Grouping of Claims

The claims at issue are grouped as follows:

Group 1: claims 1-12 and 19-27 as rejected under 35 USC 112, first paragraph;

Group 2: claims 1, 8-12, 19-21 and 24-25 as rejected under 35 USC 103 over Pitel.

ARGUMENTS

Re Group 1

Examiner rejected claims 1-12 and 19-27 under USC 112, first paragraph, as lacking support in the specification.

Applicant traverses these rejections for the following reasons.

(a) In explaining his rejections, Examiner states that:

"... the specification ... does not provide support for ... "lower than said fundamental frequency" ... [but] ... only provides support for "at or near" ...".

Applicant disagrees with Examiner's position for at least two reasons:

(1) Original claim 11 -- which, of course is part of the specification -- expressly recites:

"an L-C circuit ... tuned to natural resonance at a frequency lower than the fundamental frequency of the AC voltage".

(2) In the second paragraph at page 7 of the specification, the following is stated:

"It has been found desirable to regulate the transistor inversion frequency ... to be equal to or higher than the natural resonance frequency of the inductor and capacitor combination".

Or course, saying that the transistor inversion frequency is higher than the natural resonance frequency of the L-C circuit is equivalent to saying that the nature resonance frequency of the L-C circuit is lower than the transistor inversion frequency.

That is, there is indeed support in the specification as originally filed for reciting in the claims that the natural resonance of the L-C circuit is lower than the fundamental frequency of the inverter output voltage.

Re Group 2

Examiner rejected claims 1, 8-12, 19-21 and 24-25 under 35 USC 102b as being anticipated by Pitel.

Applicant traverses these rejections for the following reasons.

(b) In explaining his rejections, Examiner states that:

"... no patentable weight is given to the "lower than said fundamental frequency" paragraph in view of the 35 USC 112 rejection above".

It is inappropriate of Examiner not to give patentable weight to a clearly enunciated limitation in Applicant's claimed invention, even if that limitation might separately be found by Examiner as lacking adequate support in the original specification.

(c) Applicant refers to his traversal above of Examiner's "112" rejections.

Ole K. Nilssen, Pro Se Applicant

APPENDIX

CLAIMS on Appeal in Serial No. 07/579,569

1. An arrangement comprising:

a source providing an alternating voltage across a pair of source terminals; the alternating voltage having a fundamental frequency;

a series-combination of an inductor and a capacitor; the series-combination being: (i) naturally resonant at a frequency lower than said fundamental frequency, (ii) effectively connected across the source terminals, thereby to draw a source current from the source terminals, and (iii) connected in circuit with a pair of output terminals across which is provided a substantially sinusoidal output voltage; the inductor means being coupled with an auxiliary winding, thereby to cause an auxiliary voltage to be provided from this auxiliary winding; and

a gas discharge lamp means having a first thermionic cathode with a pair of cathode terminals connected with the auxiliary winding by way of a connect means; the lamp means also having a second thermionic cathode; the substantially sinusoidal output voltage being applied between the first and the second thermionic cathodes.

2. The arrangement of claim 1 wherein the coupling between the inductor and the auxiliary winding is sufficiently loose so that, in case an electrical short circuit were to be placed across the auxiliary winding, the magnitude of the source current would be prevented from increasing to a detrimentally high level.

3. The arrangement of claim 1 wherein the coupling between the inductor and the auxiliary winding is sufficiently loose so that, in case an electrical short circuit were to be placed across the auxiliary winding, the inductance represented by the inductor would not decrease by more than half.

4. The arrangement of claim 1 wherein the connect means includes resistor means.

5. The arrangement of claim 4 wherein the resistor means is a non-linear resistor means.

6. The arrangement of claim 4 wherein the resistor means includes an incandescent filament means.

7. The arrangement of claim 1 wherein the connect means includes limiting means operative to manifestly limit to a pre-established level the magnitude of any current drawn from the auxiliary winding.

8. The arrangement of claim 1 wherein the source includes frequency-converting power supply means operative to be powered from the power line voltage of an ordinary electric utility power line and to provide said alternating voltage; the fundamental frequency of the alternating voltage being substantially higher than that of the power line voltage.

9. The arrangement of claim 1 wherein the magnitude of the source current is an inverse function of the magnitude of the inductance of the inductor.

10. The arrangement of claim 1 wherein the series-combination is naturally resonant at a frequency lower than said fundamental frequency.

11. An arrangement comprising:

a source of power line voltage;

rectifier means connected with the source and operative to provide a DC voltage at a set of DC terminals;

inverter means connected with the DC terminals and operative to provide an AC voltage across a pair of inverter terminals;

an LC circuit having a tank inductor connected with a tank capacitor; the LC circuit being: (i) connected in circuit with the inverter terminals, (ii) tuned to natural resonance at a frequency lower than the fundamental frequency of the AC voltage, (iii) operative to draw an inverter current from the inverter terminals, and (iv) connected in circuit with a pair of output terminals across which is provided a substantially sinusoidal output voltage; the inductor means having a main winding and an auxiliary winding coupled therewith; and auxiliary voltage being provided by the auxiliary winding; and

a gas discharge lamp means having a pair of cathode terminals connected with the auxiliary winding.

12. The arrangement of claim 11 wherein the main winding: (i) has an inductance of a first magnitude when no current is flowing in the auxiliary winding; (ii) has an inductance of a second magnitude when a short circuit is present across the auxiliary winding; and (iii) the second magnitude is at least half of the first magnitude.

19. An arrangement comprising:

inverter means connected with a source of DC voltage an operative to supply an AC voltage at an inverter output;

an L-C circuit having an inductor means and a capacitor means; the L-C circuit: (i) being connected in circuit with the inverter output, (ii) having a natural resonance frequency lower than the fundamental frequency of the AC voltage, and (iii) having a set of output terminals at which is provided a substantially sinusoidal output voltage; the capacitor means being effectively connected across the output terminals; the inductor means having a main winding and at least one auxiliary winding magnetically coupled with the main winding; the at least one auxiliary winding having a pair of auxiliary terminals across which is provided an auxiliary voltage; and

gas discharge lamp means having lamp terminals connected in circuit with the output terminals; the gas discharge lamp means having at least one thermionic cathode having a pair of cathode terminals connected with the axiliary terminals;

whereby the thermionic cathode is provided with cathode heating power from the auxiliary winding.

20. The arrangement of claim 19 wherein: (i) the inverter output includes a pair of inverter output terminals; and (ii) the inductor means and the capacitor means are in effect series-connected across the inverter output terminals.

21. The arrangement of claim 19 wherein the waveform of the AC voltage is substantially different from the waveform of the output voltage.

22. The arrangement of claim 19 wherein: (i) the AC voltage has a non-sinusoidal waveform; and (ii) the current flowing through the inductor has a substantially sinusoidal waveform.

23. The arrangement of claim 19 wherein: (i) the AC voltage has a non-sinusoidal waveform while the output voltage has a substantially sinusoidal waveform.

24. The arrangement of claim 19 wherein: (i) the output voltage has an RMS magnitude; (ii) the gas discharge lamp may be disconnected from the output terminals; and (iii) the RMS magnitude is substantially lower when the gas discharge lamp is connected with the output terminals as compared to when it is not so connected.

25. An arrangement comprising:

an L-C circuit having a tank inductor means and a tank capacitor means; the L-C circuit including: (i) a set of L-C circuit input terminals, (ii) a natural resonance frequency, and (iii) a set of L-C circuit output terminals; the tank inductor means having a main winding and at least one auxiliary winding magnetically coupled with the main winding; the at least one auxiliary winding having a pair of auxiliary terminals;

inverter means connected with a source of DC voltage an operative to supply an AC voltage at a set of inverter output terminals; the inverter output terminals being connected with the L-C circuit input terminals; the fundamental frequency of the AC voltage being, at least at times, higher than said natural resonance frequency; the AC voltage supplied to the L-C circuit input terminals being operative to cause a substantially sinusoidal output voltage to be provided at the L-C circuit output terminals; and

gas discharge lamp means having a pair of lamp terminals connected with the L-C circuit output terminals; the gas discharge lamp means having at least one thermionic cathode having a pair of cathode terminals connected with the axiliary terminals.

26. The arrangement of claim 25 wherein the tank capacitor means is connected across the L-C circuit output terminals.

27. The arrangement of claim 25 wherein the AC voltage has a waveform that may be properly characterized as being a squarewave.